

RESEARCH BRIEF

Exploration of provider exercise prescriptions and exercise referrals to place or professional: A pilot survey research study

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ABSTRACT

Background: Physical inactivity contributes to roughly \$28 billion in annual US health care expenditures, although few US-based providers write exercise prescriptions (EPs). Little research has explored the practice of provider referrals to places for exercise as part of an EP or part of general exercise counseling, despite the known relationship between place and health. The purpose of this pilot study, conducted with Northeast Ohio-based providers, was to assess a new instrument designed to explore provider practices related to EP and referral to place and professional.

Methods: The 88-item survey combined standardized and new items to fully address the purpose. Providers were surveyed via paper and online methods. Logistic regression was conducted to explore factors related to referrals to a specific place or exercise professional.

Results: Of 166 providers who completed the survey, 14.8% of prescribed exercise to patients and 54.3% referred patients to an exercise professional or specific place. Logistic regression analysis suggested that physicians who prescribed exercise were more likely to provide a referral to professional or place (OR = 6.12, 95% CI = 1.36 - 27.47) while physicians who had accurate knowledge of exercise recommendations were less likely to provide a referral to a professional or place (OR = 0.15, 95% CI = 0.04 - 0.57).

Conclusions: A key reason for failure to prescribe place-based exercise referrals was provider unfamiliarity with convenient and safe locations other than health system owned fitness facilities, so provision of exercise location resources for providers potentially will increase use of EPs.

Key words: Exercise prescription; Place; Primary Health Care; Survey research

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INTRODUCTION

Physical inactivity contributes to an estimated \$28 billion in annual health care expenditures in the US¹ and is considered a contributing cause to as many as one in ten annual US deaths.² Physical inactivity in adults is defined as those who recall no leisure-time physical activity in the past month. The reported percentage of physical inactivity within Ohio is 25.9%, which exceeds the national average of 23.1%.³

Exercise prescriptions (EP) are viable, economical, and policy supported-solutions that have potential to decrease global morbidity and mortality^{4,5} and are characterized, much like pharmaceutical prescriptions, as having a type and dose, dosing frequency, duration of treatment as a therapeutic goal, and anticipated adverse effects.^{6,7} EPs include a specific plan of physical activities that are designed for a specified purpose, which is often developed by a fitness or rehabilitation specialist for the patient.^{6,7} Exercise referrals, which might be provided in addition to exercise prescriptions, or as part of general exercise counseling, are characterized by health care providers identifying a specific exercise location or fitness professional as a patient resource.^{8,9}

The US, ranked 27th in the world for life expectancy, continues to lag behind other nations in efforts to encourage use of provider-initiated EPs to increase participation in physical activity among patients at risk for chronic disease.¹⁰ The US Office of Disease Prevention and Health Promotion has established and

updated guidelines for physical activity. Recommendations for adults include participating in at least 150 minutes per week of moderate-intensity, or 75 per week of vigorous-intensity aerobic physical activity and at least two days a week of strength training. Children and adolescents should get 60 minutes or more of physical activity daily and strength activities at least three days a week. Older adults and those with chronic illnesses are recommended to be as physically active as their abilities and conditions allow. Older adults are also recommended to do exercises that maintain or improve balance if they are at risk of falling.¹¹ Although increases in exercise volume have been associated with increases in musculoskeletal injury among women, beneficial effects of exercise, that include improvements in physical and mental health outcomes, counter the relatively low risk of injury associated with regular participation aerobic and strength training activities.¹²

Among US-based providers, it is estimated that only 14% regularly prescribe exercise to roughly half of their patients.¹³ By comparison, 60% of Danish physicians¹⁴ and 54% of German physicians¹⁵ reported providing detailed exercise recommendations to many of their patients on a frequent and ongoing basis. US providers have ample opportunity to recommend and prescribe exercise, as the average American accrues 2.8 physician visits per year, often in association with prevention and treatment of chronic health conditions.¹⁶

Practitioner-reported barriers that deter use of EPs include lack of expertise to appropriately recommend exercise, perceived lack of time to discuss exercise during routine care visits,¹⁷ and lack of available reimbursement for recommended exercise or lifestyle interventions.¹⁸ Association advocates of EPs for US-based physicians include the American Academy of Family Physicians (AAFP),¹⁹ the American College of Physician Services (ACP),²⁰ the American Academy of Pediatrics (AAP),²¹ and the American College of Sports Medicine (ACSM).²²

Even in countries where EPs are more common, guidance for referral to a suitable place for exercise is not necessarily provided, although place exerts tremendous influence over behavior. Physicians are likely to improve uptake of formal exercise prescription and informal exercise counseling by having knowledge about the environments that are likely to be accessed by patients.²³ Health system owned fitness facilities are at times conveniently located, but regular use of these might be cost prohibitive for some at risk patient populations. Some research suggests that outdoor exercise is perceived as more restorative²⁴ and is associated with higher levels of self-rated wellbeing,²⁵ although providers need also be aware of factors that impact patients' access to outdoor spaces such as work schedules, available transportation, location resources, and aspects of actual and/or perceived safety before emphasizing outdoor activity.

Community clinical linkages (CCL) are defined as connections between community and clinical sectors to improve population health. CCLs have potential to facilitate information sharing about potential locations for exercise.²⁶ CCL processes include varying levels of information and resource sharing, capacity enhancement, and other activities undertaken for mutual benefit and to achieve a common purpose. Clearly, incorporating referral to place or exercise professionals into EPs adds an additional layer of challenge for practitioners. Based on our review of research, this challenge has not been explored in the context of prior assessments of barriers and facilitators of EPs. Therefore, the purpose of this paper is to describe findings from a pilot survey of Ohio-based primary care practitioners designed to assess EP practices and factors associated with provider use of referrals to exercise professionals and specific places for activity.

Methods

Setting

Data were gathered during September and October of 2016 from participants who were employed by health systems in Northeast Ohio. The Institutional Review Board of Kent State University approved this research study.

Design

This research reflects a cross-sectional survey design. Because no existing instrument was identified that combined provider facilitator and barrier information with items exploring use of referrals to professionals or places, the instrument was created using items derived from multiple sources. Items included those that assessed provider practices, attitudes, facilitators, and barriers related to EPs, items about referrals to place or professional, assessment of providers' physical activity practices, and provider responses to training about EPs. The survey consisted of 88 items, mostly fixed response items, with a small number of free response options included to provide detail when an "other" alternative was chosen. The majority of items were scored using a 5 point strongly disagree to strongly agree scale. Average duration to complete the instrument was 10 minutes. Specific details about instrument development including exploratory factor analysis are reported elsewhere.²⁷

Participants

Due to the pilot nature of the study, a convenience sample of local providers was identified and contacted. Responses were solicited from 223 primary care physicians and nurse practitioners employed by two Northeast Ohio health systems and 1545 alumni of a Northeast Ohio university nurse practitioner program. To be eligible, participants must provide direct patient care as a physician or nurse practitioner in family or internal practice. A total of 166 responses were received; which reflects a low overall response rate of 9.5%, although 71% of providers within the two hospital systems responded (n = 158 out of 223 provider contacts).

Procedures

Questionnaires were administered both electronically and via paper. Respondents were offered incentives in the form of a \$10 coffee gift card through a separate contact process so response information was not associated with incentive contact details.

Measure/outcomes

The specific outcome of interest for this study was provision to patients of specific referrals to exercise locations or professionals. Providers were also asked basic demographic information, to describe aspects of their practice and experience, and to provide practice and attitudinal data related to EPs.

Statistical analyses

All statistical analyses were conducted with SPSS version 21.²⁸ Variables were derived from the 88-item questionnaire, available in its entirety through request to the first author. Descriptive analyses were conducted to summarize provider characteristics. We used logistic regression to model to the outcome referral to professional or location. The independent variables included in logistic regression analysis were derived from responses to the following survey items: provider asks patients about exercise; provider documents exercise; provider prescribes exercise; provider demonstrates accurate knowledge of physical activity guidelines; provider believes patient will engage in exercise. Missing data comprised 18.6% of the sample, calculated as: total possible sample size - the missing listwise N)/(total possible sample size).

Table 1: Characteristics and Practices of Surveyed Providers

| Factor | N | % |
|--|-----|------|
| Gender (n = 130) | | |
| Male | 50 | 38.5 |
| Female | 80 | 61.5 |
| Years practicing (n = 118) | | |
| 0 - 4 years | 35 | 29.7 |
| 5 - 14 years | 34 | 28.8 |
| 15 - 24 years | 24 | 20.3 |
| 25 + years | 25 | 21.2 |
| Specialty (n = 126) | | |
| Family Medicine | 26 | 20.6 |
| Internal Medicine | 35 | 27.8 |
| Nurse Practitioner | 37 | 29.4 |
| Other | 28 | 22.2 |
| Race (n = 130) | | |
| Black | 2 | 1.5 |
| Hispanic/Latino | 2 | 1.5 |
| Asian/Pacific Islander | 11 | 8.5 |
| White | 113 | 86.9 |
| Choose not to answer | 2 | 1.5 |
| Exercise prescription stressed in practice (n = 146) | 54 | 37.0 |
| Exercise counseling stressed in practice (n = 145) | 98 | 67.6 |
| Provider asks about patient exercise (n = 149) | 132 | 88.6 |
| Provider documents patient exercise (n = 146) | 91 | 62.3 |
| Provider assesses physical fitness (n = 130) | 27 | 20.8 |
| Provider assesses activity level (n = 130) | 109 | 83.8 |
| Provider prescribes exercise (n = 132) | 21 | 14.8 |
| Provide refer to a professional/location (n = 140) | 76 | 54.3 |

Results

Demographic and practice characteristics of the study sample are shown in Table 1, along with the number of providers who responded to each item. Of responding providers, 37.0% indicated that EPs are stressed within their practice and 67.6% suggested that exercise counseling is stressed within their practice. Only 14.8% of providers responded that they explicitly prescribe exercise to patients, while 54.3% of providers reported giving a place-based exercise referral, either in the context of EP or as part of general exercise counseling.

The logistic regression model included only the 135 cases that included responses to all five variables. In Table 2, we show regression coefficients, Wald statistics, and odds ratios with 95% confidence intervals for each factor. Only provider exercise prescriptions (characterized like pharmaceutical prescriptions including a type and dose, dosing frequency, duration of treatment as a

Table 2: Odds ratios of context-specific provider exercise referrals to place or professional

| Variable | B | Wald Chi-Square | Odds ratio | Lower 95% CI | Upper 95% CI |
|--|--------|-----------------|------------|--------------|--------------|
| Provider asks patients about exercise | 1.02 | 1.79 | 2.77 | 0.62 | 12.31 |
| Provider documents patient exercise | 0.77 | 2.84 | 2.15 | 0.88 | 5.23 |
| Provider prescribes exercise | 1.81 | 5.59* | 6.12 | 1.36 | 27.47 |
| Provider has knowledge of physical activity guidelines | -1.871 | 7.825** | 0.15 | 0.04 | 0.57 |
| Provider believes patient will engage in exercise | 0.35 | 0.09 | 1.42 | 0.15 | 13.93 |

* $p < 0.05$ ** $p < 0.01$

therapeutic goal, anticipated adverse effects, and specific plan of physical activities that are designed for a specified purpose)^{6,7} χ^2 (1, N = 135) = 7.825, $p < .01$ and providers' knowledge of physical activity guidelines (χ^2 (1, N = 135) = 5.587, $p < .05$) significantly predicted provider referral to professional or location. Providers who prescribe exercise have more than 6 times the odds of referral to a place or professional and providers who have knowledge of guidelines have 0.35 times the odds of referral.

Discussion

The purpose of this pilot survey of Ohio-based primary care practitioners was designed to assess factors associated with EP practices with particular focus on provider use of referrals to professionals and places for exercise. Although 2 out of 3 providers indicated that exercise counseling is stressed within their practice, only 14.8% of providers in the sample explicitly prescribe exercise to patients, a rate that is consistent with prior research findings.¹² Our results as a whole suggest that while many providers are willing to initiate discussion with at risk patients regarding the value of exercise, fewer are formalizing their recommendations via use of a written exercise prescription. A larger number of providers offer referral to professional or location, and provision of an EP was associated with use of these referrals while providers' accurate knowledge of exercise recommendations decreased the odds of referral to professional or place. While not statistically significant, provider belief that patients will engage in exercise as recommended, was also associated with increased odds of referral to place or professional. Providers with more accurate knowledge of the details of exercise recommendations might be more skeptical about patient participation in ample exercise, which might account for the decreased odds of referral associated with knowledge of recommendations. Previously identified barriers that include lack of confidence and knowledge to provide explicit patient guidelines were also reported by this physician sample.^{17, 18}

The proportion of providers who state they provide place-based recommendations is encouraging, although what is not known is the extent to which these recommendations are of value for patients. While providers were not asked to list the range of specific places recommended, one item asked specifically whether they made referrals to exercise facilities owned by a health system. Each health system represented in this research owns or manages one or more fitness centers proximate to care facilities, and most provider referrals that were made to specific locations recommended the system-owned facility. If health system-owned fitness locations are not perceived as a convenient location by patients, provider referrals to these locations are less likely to encourage patient exercise, based on prior research that has identified lack of proximate exercise locations as a barrier to exercise in older adults.²⁹ Additionally, referrals made by physicians to community exercise locations that are geographically close to patients are associated with greater likelihood of enduring changes to exercise participation.³⁰ Therefore, providers would benefit from greater knowledge about a range of exercise resources that might be appropriate and conveniently located for patients.

To encourage non-prescribing providers to emphasize exercise, and to address lack of knowledge about places for exercise outside of system-owned facilities, these findings suggest potential interventions might be best served to focus on physician education and promotion of available information sources, especially with regard to place-based exercise resources through CCL. A CCL between a health system and community physical activity locations such as parks, community centers, and bike share programs, would offer provider access to detailed information about where to refer a patient as well as an individual to contact about the referral.³¹ Ideally, such an agreement would include specific protocols about information sharing and patient follow up in order to track adherence to the referral by the patient and create a closed loop of communication.

Operationalized clinical practices and standards of care, including CCL, could also ensure providers refer specific kinds of patients to specific kinds of locations. Development of an algorithm for exercise referrals that considers each patient's disease risk factors, socioeconomic challenges, geographic locations, and personal barriers to exercise may have potential for increasing patient adherence by considering likely patient barriers. Due to the additional mental health benefits of exercising outdoors, free access, and for some patients, proximity to their homes, patients might incur more immediate benefits, such as mood enhancement and stress reduction, and engage in exercise more frequently if referred to parks or trails. The specific characteristics of each location including free access, safety, quality, and accessibility provided by a community collaborator may increase both the number of the referrals by the provider and adherence by the patient. Additionally, outdoor spaces are often supported local and state taxes, and therefore are an economical solution when compared to the cost of accessing commercial facilities to help a greater proportion of the population to reach the national recommendations of 30 minutes of activity per day most days of the week.

Perhaps ironically, an existing model for a health system and community physical activity resource sharing plan is demonstrated by pharmaceutical industry marketing, as research has demonstrated that provider prescribing behavior is influenced by interactions with sales representatives.³² Although there are clear differences between pharmaceutical prescriptions and EPs, given location knowledge gaps suggested by physician focus on referral to health system owned facilities, it is reasonable to believe that physicians might welcome exercise resource information provided by experts made available through a CCL. An added benefit of exercise location information for practitioners is that education on places for exercise might be beneficial to practitioners and clinical staff as well as patients. Future research efforts, potentially including group interviews or vignette designs, could be used to gain additional information about provider preferences for type, content, and delivery of exercise place and other EP resource information.

As with any research study, some limitations apply. The response rate from nurse practitioners, who often engage in direct patient contact, and whose view might differ from those of physicians, was extremely low (n = 8 out of 1545 email contacts). For this research, nurse practitioner alumni were contacted via last known email addresses; it is possible that these mailboxes are not currently monitored. This cross-sectional pilot study assessed a small number of practitioners who primarily represent two health systems in one region of Ohio, so results are exploratory and not generalizable. Additionally, 18.8% of total data were missing, and all data were based on self-report so actual provider practices may vary.

PUBLIC HEALTH IMPLICATIONS

Primary-care practitioners in the US are less likely to provide formal EPs than some of their counterparts in other developed countries. Despite the strong association of place with health, place-based referrals are not consistently provided with EPs. Data from this pilot administration of a survey suggests that Ohio physicians report barriers that prevent greater use of formal EPs or referrals to exercise professionals and specific places, including lack of exercise and place knowledge. A potential direction for intervention research is development of physician resources and information, available either via in person education or as content that can be accessed on demand via electronic health records and CCL.

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